Acta Biologica Szeged 17 (1—4), pp. 159—166 (1971)

MOLLUSCA PERIODS IN THE SEDIMENTS OF THE HUNGARIAN PLEISTOCENE VI. THE LOWER PART OF THE MIDDLE ARID PERIOD IN THE BORING OF FELSŐSZENTIVÁN

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(Received December 21, 1970)

This paper is the sixth publication of a series published yearly since 1962 and elaborating the *Mollusca* material of the boring at Felsőszentiván in 1954. The boring is 77 m deep, carried out for scientific aim and with due thoroughness by Professor I. MIHÁLTZ, the then head of the Institute for Geology of the University in Szeged. Prof MIHÁLTZ prepared a detailed geological profile of the sedimentary complex and has personally dictated the data to the present author. The profile has been divided by the latter on the basis of the *Mollusca* fauna into periods and subperiods. The middle arid (IIIrd) period is characterized above of all by the absence of aquatic fauna, resp. by its great poverty. The period may be divided into 13 subperiods. The present paper is dealing with the four lower ones (subperiods III/10—13) including the part 36.2—44.2 m of the profile. The elaboration is following the method of the previous papers.

Subperiod III/10. 36.2—36.5 m

It is formed by a single 30 cm boring sample. The material is quicksand with some loess. It is distinctly limited by the high number of „*Mollusca* exemplars altogether" (411, opposite to 9 in the above adjacent sample and 19 in the below adjacent one. (The evaluation of its fauna is based on a comparison with that of the above adjacent loess. That loess is the lowest part of subperiod III/9, lying from 34.6 m to 36.2 m, consisting of eight 20 cm boring samples, and containing 298 *Mollusca* exemplars altogether. Its detailed discussion was presented in the previous publication [HORVÁTH, A. (1966): The middle part of the middle arid period in the boring of Felsőszentiván. — Acta Biol. Szeged, 12, 149—158].

The aquatic fauna in subperiod III/10 is only represented by 1 single exemplar of *Anisus planorbis,* while in the adjacent loess it was represented by 1 exemplar of *Bithynia leachi.*

The number of exemplars of the amphibian *Succinea oblonga* (14) is moderate, but, compared to that in loess (together 19 exemplars, with 0—5 exemplars per sample), it has considerably increased and indicates more humidity.

The hygrophilic ubiquitous species (10 species, 387 exemplars) represent the bulk of the fauna. The number of species is two more than in loess, this increase being, however, only 1 exemplar of *Vertigo pygmaea* and 1 of *Vallonia enniensis.* They are fairly cold-resistant but also somewhat xerophilous species, their appearance suggests warmer weather. The other eight species are common with those in loess, but their numerical ratio differs considerably in the two layers.

Vallonia costata has the most exemplars (93), it is a fairly cold resistant and rather xerophilic species. The number of its exemplars is 15 in loess and 0—5 per sample, being there quantitatively on the fourth place. *Punctum pygmaeum* (79) is the second one, in loess — with 14 exemplars and 0—5 exemplars per sample — it is on the sixth place. Its natural increase is motivated by more humidity an dircher vegetation. *Cochlicopa lubrica* (66) is the third species that multiplied also as humidity increased. (In loess 2—21 per sample, altogether 88). *Trichia hispida* (48) is here the fourth, in loess (98, but 4—31 per sample), however, it takes the first place. It is a typical loess mollusc, tolerating the arid cold loess-forming climate better than the other species, multiplying more intensely as a result of increased humidity and warmth. *Euconulus trochiformis* (37) and *Vallonia pulchella* (36) are cold resistant but rather hygrophilic species. In loess, mainly owing to aridity, each of them is represented only by 3 exemplars altogether and so they take the last place. *Pupilla muscorum* (23) is the seventh, it lived nonetheless under more favourable conditions than in loess where it took the third place with 33 exemplars altogether and 0—9 exemplars per sample. It is a good cold-resistant species, satisfied with little humidity, but with the increase of humidity it got under more favourable conditions. *Deroceras agreste* (3) lived both here and in loess, too (15, 0—5 per sample). aproximately under equally unfavourable conditions.

The inhabitants of the groves are represented in this 30 cm layer by four species and nine exemplars, while in the 160 cm loess layer we have found only three species and eight exemplars of them. The *Perpolita hammonis* (3) occurs in four of the eight loess samples, each with 1 exemplar, and *Arianta arbustorum* (3), in loess similarly with three exemplars but only in a single sample. *Goniodiscus ruderatus* (2) and *Perforatella bidens* (1) could not be found in loess. On the other hand, *Columella edentula* subsp. *columella* was only found in loess, in a single exemplar. The subspecies is a subalpine form above the timber-line, from a colder loess climate. The presence of the grove-dwelling fauna occurring rarely both here and in loess, suggests, however, more humidity and a richer vegetation.

No xerophilous species have been found here. Even in loess only one exemplar of *Imparietula tridens* was found. The species may have got more sunshine in the colder but more arid loess-forming climate, permitting it to survive.

The molluscs discussed here in detail remind us of the moist clearings of the Hungarian mountains of medium height. The above mentioned data suggest a cool humid climate, milder and more humid than that of the loess-forming period, and colder than the present climate of the Great Hungarian Plain. The vegetation may have been richer than that of the loess period but, as a matter of fact, it must have been rather open.

Subperiod III/11. 36.5—37.5 m

The layer is 1 m thick, consisting of two samples of 30 cm and two of 20 cm each. Its material is fine sand containing a little humus and loess. It is distinctly limited from the adjacent subperiods by the low values of *Mollusca* exemplars altogether (19—47) both upwards (411) and downwards (155—615). In the subperiod 137 exemplars were found, with no aquatic species at all.

From the two amphibian species *Succinea oblonga* (14) occurs in every sample but with a much lower number of exemplars than those observed is subperiod III/10, indicated much less humidity. The highly hygrophilic *Succinea putris,* found only in the third sample and only with two exemplars, may refer to the periodic presence of water.

The hygrophilic ubiquists are represented by eight species and 103 exemplars. The fauna adjacent above, continues in them with a much lower number of exemplars. Their population reminds us rather of the loess of subperiod III/9. Similarities to the loess fauna: absence of *Vertigo pygmaea* and *Vallonia enniensis,* the low number of exemplars, the first place of *Trichia hispida* (66) and the second one of *Cochlicopa lubrica* (20). The exemplar number of the other six species is much lower: *Vallonia costata* 6, *Pupilla muscorum* 5, *Vallonia pulchella* 2, *Punctum pygmaeum* 2, *Euconulus trochiformis* 1, *Deroceras agreste* 1. These data suggest an arid cold climate reminding of loess and an open vegetation. The grove-dwellers are represented by three species and thirteen exemplars. This fauna reminds us of the previous subperiod, being anyway somewhat poorer than that. *Perforatella bidens* is missing. I have found only one exemplar of it in the previous subperiod. And it may be not a matter of mere chance that just this most thermophilic species is absent. The other species are the same as those in the previous subperiod, their exemplar number is equally low *(Perpolita hammonis* 6, *Arianta arbustorum* 5, *Goniodiscus ruderatus* 2), and their occurence became sporadic. After all, the grovedwellers also indicate a more arid and colder climate than that of the previous subperiod.

I have found thermophilic species only in the two lower samples where they are represented by five exemplars of *Helicella hungarica.* The cool, humid milieu of the previous subperiod was unfavourable for the thermophilic species, and I have actually found none of them. Here, however, in a more arid colder climate that had anyway more sunshine, at least when the effect of cold was more moderate they managed to survive.

After all, this subperiod was much more arid and colder than the previous one, and had a poorer vegetation. The two lower boring samples came from a somewhat milder climate, as proved not only by the presence of thermophilic species, but also by the increase in fauna appearing with a general character.

Subperiod III/12. 37.5—40 m

The layer is 2.5 m thich and consists of five 50 cm boring samples. Its material is from 37.5 m to 38 m loess with some humus, lower fine sand with some loess containing a little humus between 38—39 m. It is distinctly delimited both upwards and downwards by the high values of *Mollusca* exemplars altogether. The samples are half m broad, i. e. larger than those of the previous subperiod, but upwards the difference continues to be very obvious, even if the exemplar numbers are decreasing proportionally. Downwards, in the next subperiod, the size of the samples remains 0.5 m. The total number of exemplars is 1757.

An aquatic species, namely four exemplars of Stagnicola palustris, could be found only in the upmost sample where it might indicate the periodical presence of stagnant water.

The amphibian species are the same as those in the previous period. *Succinea oblonga* (206) occurs here, too, in all the samples, but the number of its

exemplars is much higher, this means a more humid milieu and a warmer climate. *Succinea putris* (1) was found only in the first sample. It indicates the presence of water, since it lives only on the waterside.

The hygrophilous ubiquists, with 10 species and 1435 exemplars, constitute the bulk of the fauna here. The fauna augmented with the species *Vertigo pygmaea (11) and Vallonia enniensis* (4). These are somewhat thermophilous, their presence means more warmth. The other eight species are the same as those in the previous subperiod. Like in the previous subperiod, the first place is taken here too by the species *Trichia hispida* (931), the second one by *Cochlicopa lubrica* (184) but in an immensely increased number of exemplars. The other species are: *Vallonia pulchella* (89), *Pupilla muscorum* (76), *Punctum pygmaeum* (47), *Deroceras agreste* (47), *Euconulus trochiformis* (35), with equally superior exemplar numbers. All these numerical augmentations may be motivated by a more humid and milder environment. The amount of *Vallonia costata* (11) is also somewhat larger, although it was the third one in the quantitative order of the hygrophilous ubiquists of the previous subperiod and the ninth in this one. It is a good cold-resistant but also thermophilic species. Its multiplication here means a rise in temperature, remained, anyway, infavourable for the species.

The grove-dwellers are represented by four species and 88 exemplars. *Columella edentula* subsp. *columella* (1) did not occur in two previous subperiods. We have found it at last in the loess of subperiod III/9, where it occurred in two places with 1 exemplar in each of them. At present, this subspecies lives in the high mountains of Europe and in Northern Europe above the timber-line, indicating a far colder climate than prevails present by in the Hungarian Plain. The other three species are the same as these in the previous subperiod. *Arianta arbustorum* (45) is leading but its exemplar number is considerable only in the uppermost sample (29), in the other samples it appears systematically but only with low exemplar numbers (ranging from 2 to 7). *Perpolita hammonis* (37) is forming similarly a full sequence, its exemplary number varying between 1—10. In the three lower boring samples its quantity is larger that that of the previous species. *Goniodiscus ruderatus* (5) is everywhere rare but is missing only from one boring sample. After all, as compared to the previous subperiod, the occurrence of grove-dwellers is more systematic, and their amount has augmented, as well. This favourable change may be attributed to the effect of the more humid environment.

There are 2 species and 23 exemplars of thermophilic group. The more thermophilous *Helicella hungarica* (16) is restricted nearly entirely (with 15 exemplars) to the uppermost sample while the less thermophilous *Imparietula tridens* (7) occurs in the three lower samples. In the cool humid milieu of the subperiod the thermophilic group only vegetated. Their life conditions, however, embettered somewhat as compared to the previous subperiod, and this suggests a little increase in warmth.

After all, the milieu effect in the subperiod is cool and humid, much more humid and somewhat warmer, than in the previous subperiod. The vegetation increased but remained of open character. The uppermost sample of the subperiod may have originated in a somewhat milder climate, this may be concluded from the relatively high exemplar number of *Helicella hungarica* and *Arianta arbustorum.*

Subperiod III/13. 40—44.2 m

The layer is 4.2 m thick and consists of 9 boring samples, from which 7 are 50 cm, one is 30 cm and one 40 cm deep. Its material is quicksand, it is distinctly delimited both upwards and downwards by the lower amounts of „*Mollusca* exemplars altogether." Downwards the limit of the subperiod is common with that of the lower humid period (IV.) A clear-cut border line is drawn here by the quick augmentation of the aquatic fauna, as well. The number of exemplars found in the subperiod is 663 altogether, while 1757 were found in the much thinner layer of the previous subperiod. The aquatic fauna is represented only by three species and six exemplars: *Anisus planorbis* (3), *Stagnicola palustris* (2), *Anisus spirorbis* (1). These are ubiquitous species of a wide range of resistance. Aquatic species occur only in four of the nine samples of the subpeirod. Newertheless, the aquatic fauna is present throughout the whole subperiod with low exemplar numbers and incomplete. The waters may have been of seasonal character and, for motivating duly the low number of species and exemplars, low temperature of these waters is also presumable. These waters may have originated from the yielding of frozen soil and possibly from thawing of the snow.

The number of amphibian species is four. Two of them are common with the previous subperiod, while two others *(Carychium minimum, Succinea pfeifferi)* represent a surplus. The increase of species number may be attributed to the augmentation of water. Owing to more water we would expect an increase in the exemplar number, too, but we have experienced on the contrary, a decrease. The total number of exemplars is 171. *Succinea oblonga* (166) is the most numerous, constituting a full sequence, but its exemplar numbers are generally lower than in the previous subperiod. It is a characteristic loess mollusc but its cold-resistance is moderate, and in Northern Europe it is at present already scarce. Here it was influenced unfavourably by cold humidity. The quantity of the other three species is negligible. *Succinea putris* (3) and *Succinea pfeifferi* (1) are fairly cold-resistant, but they need a waterside. *Carychium minimum* (1) is equally cold-resistant, it is primarily a coastal species but in a humid environment it survives even far from water.

The hygrophilic ubiquitous species are represented by 10 species and 434 exemplars. The species are common with those in the previous subperiod, their exemplar number is, however, lower. (The category was represented in the much thinner layer of the previous subperiod by 1435 exemplars.) *Trichia hispida* (295) and *Cochlicopa lubrica* (53) maintain their leading on the first and second places, although with a strongly decreased exemplar number. *Pupilla muscorum* (28) has got, in regard to quantity, from the fourth to the third place but its exemplar number decreased also very much. The number of exemplars of the other seven species is low. They follow in this quantitative order: *Deroceras agreste* (14), *Punctum pygmaeum* (13), *Vallonia pulchella* (11), *Vallonia costata* (7), *Euconulus trochiformis* (7), *Vertigo pygmaea* (5), *Vallonia enniensis* (1). Unlike the previous subperiod, the decrease in the number of exemplars appears here in these species, too. The ubiquitous species mentioned in the paper prefer above all the humid coastal milieu, largely because of the richer vegetation. There was a shore here, nevertheless the fauna became poorer. This could be caused only by the cold that also prevented the coastal groves from developing.

The grove-dwellers are represented by four species and 35 exemplars. As compared to the four species and 88 exemplars found in the previous subperiod, this means a considerable decrease of the exemplar number. *Arianta arbustorum* (18) takes again the first place. It is fairly cold-resistant, In Northern Europe it survives even in the tundra. As concluded from its low exemplar number, here it may have vegetated under similar conditions. *Perpolita hammonis* (14) has maintained, although with a decreased exemplar number, its second place. Its cold-resistance is somewhat lower than that of the former species but it occurs beyond the timber-line in the tundra and in the Alps, as well. *Columella edentula* subsp. *columella* (2) occurs only in a single sample, being an evidence there of cold and open vegetation. *Clausilia dubia* (1) was not found in the previous subperiod. Its coldresistance is considerable but lower than that of the two previous species. It is a forest-dweller but occurs occasionally outside the forest, as well. In the Alps, is also found at altitudes about 2400 m. Here it is only a negligible element in the fauna, probably because of the cold and treeless milieu. *Goniodiscus ruderatus* is fully missing, although in the previous subperiod it occurred regularly except one sample. It is a good cold-resistant species but sensitive to much humidity and adheres to a woody environment. The cause of its absence here may have been much humidity and the open character of vegetation. After all, the qualitative and quantitative composition of the forest-dweller category in this subperiod seems to prove a cold, humid, treeless environment.

We have found two species and 17 exemplers of thermophilic snails. Certainly not by mere chance, they are represented almost exclusively by *Imparietula tridens* (16). Among the thermophilic species mentioned in this paper this species is the most resistant to cold and humidity. In the Alps it got up till 1000 m but does not live in Nonthern Europe any more. Its role is a subordinate, as it was in the previous subperiod. *Abida frumentum* (1) is somewhat more thermophilic and more sensitive to humidity and was missing from the previous subperiod, here too, I have found it only in the uppermost sample. *Helicella hungarica* that adheres the most to the warm arid environment still appeared sporadically in the previous subperiod but in this subperiod it couldn't be found any more. Solar radiation is much more effective at our latitude than in Northern Europe, therefore the thermophilic species had got enough light and warmth to survive. After all, subperiod III/13 was more humid and much colder than subperiod III/12. It was characterized by a much colder climate than the present one, by cold seasonal standing waters and an open vegetation. As far as the molluscs were concerned the most unfavourable period was during the formation of the layer 41—42.5 m. In these three samples, the thermophilic species together with several ubiquitous ones are missing, and also the grove-dwellers became rarer. This decline is shown by the amphibian Succinea oblonga only in the medial of the three samples, but at the same place we could find the aquatic *Anisus planorbis*, as well. The poor fauna of the three samples was caused, therefore, not by drought but by the increase of cold.

Stratigraphical chronology

In the previous publication I determined the time of loess formation on the bottom of subperiod III/9 from 34.6—36.2 m as a glacial continental part of $Riss_1$. This loess extends downwards till a dept of 40 m (bottom of subperiod

Astronomical chronology	Riss loceanic part										Mindel—Riss interglacial subarctic								
Stratigraphical chronology	Riss loceanic part										Mindel—Riss interglacial								
Mollusca subperiods	III/10	III/11				III/12					III/13								
Stratigraphical profile	Running sand with some loess	Fine sand	With some	Humus and	Loess	Loess with some humus	Fine sand with some	Humus and loess	Fine sand	With loess	Quicksand								
Species \ Depth m	36.2—36.5	36.5—36.8	36.8—37.—	37.—37.3	37.3—37.5	37.5—38.—	38.—38.5	38.5—39.—	39.—39.5	39.5—40.—	40.—40.5	40.5—41.—	41.—41.5	41.5—42.—	42.—42.5	42.5—43.—	43.—43.5	43.5—43.8	43.8—44.2
Stagnicola palustris O. F. MÜLL.						4	—										1		1
Anisus planorbis L.	1											1		1					1
Anisus spirorbis L.																	1		
Aquatic species altogether	1	—	—	—	—	4	—	—	—	—	—	1	—	1	—	—	2	—	2
Carychium minimum O. F. MÜLL.																	1		
Succinea putris L.				2						1		1						2	
Succinea oblonga DRAP.	14	1	4	3	6	23	5	86	27	65	10	12	13	2	14	27	24	15	49
Succinea pfeifferi RM.																			1
Amphibiotic species altogether	14	1	4	5	6	23	5	86	27	66	10	13	13	2	14	27	25	17	50
Cochlicopa lubrica O. F. MÜLL.	66	4	8		8	60	13	52	26	33	3	5			2	12	13	15	3
Vertigo pygmaea DRAP.	1							4	1	6	1					2	1	1	
Pupilla muscorum L.	23	1	2		2	6	5	42	10	13	4	3	1		3	6	7	3	1
Vallonia pulchella O. F. MÜLL.	36			1	1	7		38	15	29	4	2				2	3		
Vallonia enniensis GREDLER	1					3				1		1							
Vallonia costata O. F. MÜLL.	93	2	3	1		6		4		1	1			1			3	2	
Punctum pygmaeum DRAP.	79	1	1			25	1	16	2	3	2	1				2	6	2	
Euconulus trochiformis MONT.	37			1		4		16	4	11	1	2				1	2	1	
Deroceras agreste L.	3			1		4	1	16	10	16	4				1	1	5	3	
Trichia hispida L.	48	10	14	24	18	126	124	322	151	208	35	32	12	8	16	52	70	39	31
Hygrophilic ubiquist species altogether	387	18	28	28	29	241	144	510	219	321	55	46	13	9	22	78	110	66	35
Columella edentula DRAP.									1							2			
Clausilia dubia DRAP.												1							
Goniodiscus ruderatus STUD.	2		2			1	1	1		2									
Perpolita hammonis STRÖM	3		1		5	6	1	11	9	10	2	3	1			3	3	2	
Perforatella bidens CHEMN.	1																		
Arianta arbustorum L.	3			2	3	29	4	3	2	7		2	2	1		3	4	5	1
Inhabitants of the groves altogether	9	—	3	2	8	36	6	15	12	19	2	6	3	1	—	8	7	7	1
Abida frumentum DRAP.											1								
Imparietula tridens O. F. MÜLL.								3	1	3	7	1				4	2	1	1
Helicella hungarica SOÓS et H. WAGNER				1	4	15		1											
Thermophilic species altogether	—	—	—	1	4	15	—	4	1	3	8	1	—	—	—	4	2	1	1
Mollusca exemplars altogether	411	19	35	36	47	319	155	615	259	409	75	67	29	13	36	117	146	91	89

III/12) but it occurs only in a mixed state. Following the process of sediment formation upwards from below (in the chronological order of formation), we can establish the following: From 39 to 40 m the sediment is fine sand with some loess, delimited under 40 m by quicksand. The sandcarrying western winds remained dominant but became weaker, carrying only fine sand instead of common sand from the bed of the Danube. The eastern winds were carrying loess. This change was caused by an inland ice-cap beginning to develop. The development of an ice-cap could take place in a moist climate. This climate is proved by the fauna, too, because above 40 m it becomes suddenly richer and remains so. The change in fauna is not motivated by the change of sediment (the ancient substratum) but only by that of the climate. In a depth from 38 to 39 m, the quicksand with some loess is mixed also with a little humus, the remainder of a vegetation that had increased as a result of a more rainy climate. This change is also indicated by the fauna since in the sample from 38.5 to 39 m the number of „*Mollusca* exemplars altogether" is 615 and only 259 further below. The increase has affected the hygrophilic species (*Succinea oblonga,* hygrophilic ubiquitous species) while the thermophilic fauna changed hardly, so it was rather humidity than warmth which increased. The much poorer fauna of the next sample (from 38 to 38.5 m) corresponds to a more arid and colder milieu. This change may have been caused by the cold-storage effect of the ice-cap thickened as a result of the larger quantity of precipitation. The humus here may already be a consequence of the decay of former rich vegetation. From 37.5 to 38 m the material is loess with a little humus. With the predominance of loess-carrying eastern winds, a more arid and sunnier climate began. This change is indicated by the comparatively large amount of the thermophilic *Helicella hungarica* (15). The increase of the grove-dweller *Arianta arbostorum* (29) is also considerable. Otherwise, the fauna may be considered as an average type, as compared with subperiod III/12. From 36.5 to 37.5 m the material is fine sand with a little humus and loess. The sediment is similar to that between 38 and 39 m but the poor fauna corresponds to a much more arid and colder environment (subperiod (III/ /11.). That is easy to understand since the ice-cap was already considerably thick. From 35.2 to 36. 5 m the sediment is quicksand with a little loess. The western winds were more efficient, for they carried quicksand, but the eastern winds had also some effect since the loess formation went on. The considerably richer fauna without any thermophilic species indicates the cool humid climate, corresponding to the change (subperiod III/10).

After all, the loess containing sediments discussed here occupy an intermediate position between the loess adjacent from above and the loess-free sediment adjacent from below. They may be considered, therefore, only an a sediment of the oceanic period, introducing $Riss_1$ glacial.

From 40 m to 44.2 m (subperiod III/13) the sediment is quicksand. Here the quicksand means the predominance of western winds, the lack of loess the absence of eastern winds, and the lack of humus the absence of vegetation needed for humus formation. This deficiency of vegetation may be attributed to the cold weather. The cold, humid environment with an open vegetation, reconstructed from the fauna, entirely corresponds to these conclusions. The quicksand is still present in a 40 cm sample as far as 44.6 m. The fauna of that sample occupies an intermediate position between the middle dry (III) and the

lover humid periods (IV) but, on account of its richer aquatic fauna I have classed it rather amoung the latter. Further downwards, as far as 71 m, there follows a variable series of sediments without containing, however, any loess layer. This series of sediments may only be considered, on account of its location and extent, as a deposit of the Mindel-Riss (large interglacial). The quicksand of subperiod III/13 is therefore already the uppermost part of the Mindel-Riss interglacial.

Astronomical chronology

The previous publication colsed with the continental part of $Riss_1$ glacial. Moving back further towards older times, there follows on the climate curve of MILANKOVICH—BACSÁK the oceanic part of $Riss_1$ glacial, the first 5000 years of the $Riss_1$ glacial lastening for 11 000 years. It was a cold oceanic type of climate, when the inland ice-cap gradually developed. This period can be identified, on the basis of the data mentioned about their sediments and faunas, as the part of the profile ranging from 36.2 to 40 m. Further on, the climate curve is recording the Mindel-Riss interglacial, and at the end it shows a subarctic range of 5700 years. The formation time of the quicksand of subperiod III/13 can be identified with this part of the climate curve. The cold continental climate type offers reasonable explanation for the comparatively poor fauna of the subperiod and for the conditions reconstructed from it.

(To be continued)